

- Q3 12. (Amended) An apparatus as in claim 1 additionally comprising  
a modem, for coupling a modem upstream signal to the first up-converter stage,  
and for coupling a modem downstream signal to a final downconverter stage.

Amendments to the claims are indicated in the attached "Marked Up Version of Amendments" (pages i - ii).

#### REMARKS

Claims 2-8 and 12 were rejected as being dependent upon a base claim that was found to be unpatentable in view of the prior art. However, the Examiner indicated these claims would be allowable if rewritten in independent form.

With entry of the foregoing Amendment, claim 2 is now rewritten in independent form including all the limitations of base claim 1 from which it previously depended.

Therefore claim 2 is now allowable.

Remaining claims 3-12 also now each depend from claim 2. These claims are therefore also now allowable.

Claims 13 and 14 were previously indicated as being allowed over the prior art.

It is believed that all claims are now in condition for allowance.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

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MARKED UP VERSION OF AMENDMENTSClaim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

2. (Amended) [An apparatus as in claim 1] An apparatus for microwave radio frequency communication wherein an upstream radio frequency (RF) band is used for transmitting signals in an upstream direction, and a downstream radio frequency band is used for receiving signals in a downstream direction, the apparatus comprising:
- an up-converter comprising at least two up-converter stages, each up-converter stage including a mixer, and each mixer accepting a respective local oscillator signal wherein a final up-converter stage is connected to provide a transmit RF upstream signal;
  - a down-converter, comprising at least two down-converter stages, each down-converter stage including a mixer and accepting a respective local oscillator signal wherein a first down-converter stage is connected to receive a receive RF downstream signal;
  - the mixers in the first down-converter stage and the final up-converter stage being connected to receive a common local oscillator signal;
  - a local reference oscillator, for providing a local reference signal;
  - a first frequency multiplier circuit, connected to receive the local reference signal, and to provide the common local oscillator signal at a frequency which is an integer multiple of the local reference signal;
  - wherein the local reference signal is also to derive the local oscillator signal coupled to one of the mixers in a down-converter stage which is not the first down-converter stage, or the local reference signal is used to derive the local oscillator signal coupled to one of the mixers in an up-converter stage which is not the final up-converter stage; and
  - wherein the local reference signal is fed to a second frequency-multiplier circuit to provide the local oscillator signal coupled to the mixer in the final down-converter stage.
4. (Amended) An apparatus as in claim [1] 2 wherein the down-converter stages shift a carrier frequency of the microwave RF downstream signal by a factor of 10 times the local reference.

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5. (Amended) An apparatus as in claim [1] 2 wherein the up-converter shifts a carrier frequency of the microwave RF upstream signal by a factor of 10 times the local reference.
6. (Amended) An apparatus as in claim [1] 2 wherein the first frequency multiplier circuit includes a series pair of frequency doubler circuits.
7. (Amended) An apparatus as in claim [1] 2 additionally comprising:  
a second reference local oscillator, coupled to provide the local oscillator signal to one of the mixers in an up-converter stage which is not the final up-converter stage, or coupled to provide the local oscillator signal to the mixer in a down-converter stage which is not the first down-converter stage, the frequency of the second local reference oscillator being selected to separate the upstream and modem downstream signals by a desired guard band.
8. (Amended) An apparatus as in claim [1] 2 wherein an upstream RF band and a downstream RF band are contiguous in frequency.
9. (Amended) An apparatus as in claim [1] 2 wherein an upstream RF band and a downstream RF band are separated in frequency.
10. (Amended) An apparatus as in claim [1] 2 wherein the transmit RF upstream signal and the receive RF downstream signal are coupled to an antenna.
12. (Amended) An apparatus as in claim [1] 2 additionally comprising  
a modem, for coupling a modem upstream signal to the first up-converter stage, and for coupling a modem downstream signal to a final downconverter stage.

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